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May 7, 1992

Document Processing Office (TS-790)
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
ATTN: 8(e) Coordinator

88920002272

Dear Sir or Madam:

Subject: Report submitted in accordance with the U. S. Environmental Protection Agency Statement of Interpretation and Enforcement Policy: Notification of Substantial Risk-Section 8(e) TSCA.

The following information is submitted in accordance with the above statement. The submission pertains to a report reviewing effects observed during acute oral toxicity studies in rats and mice with tetracyanoethylene (CAS # 670-54-2). The data were generated in 1962 and were only recently reviewed following a customer inquiry.

Based on the sales volume of this research and laboratory chemical, we do not feel that the information presented in this letter reasonably supports a conclusion of substantial risk. It is being submitted, however, to enable the Agency to draw its own conclusions.

Two male rats at each dose level were administered doses of 1, 5, or 10 mg/kg in an acute oral toxicity study. Two male mice at each dose level were administered doses of 5, 10, 25, 50, 100, 200, 400, 800, 1600, or 3200 mg/kg. Estimated oral LD_{50} values were 5 mg/kg and 5-10 mg/kg for rats and mice, respectively.

Rat study

Both rats in the 10 mg/kg dose group and one of two rats in the 5 mg/kg dose group died following administration of the test material. All other rats survived to study termination. Abnormal clinical signs observed in the 10 mg/kg dose group were convulsions and prostration. Both animals died within minutes of receiving the test material. At a dose of 5 mg/kg, one animal had convulsions and died on the day of dosing. No abnormal clinical signs were seen in animals surviving to study termination. The low LD_{50} in rats is consistent with a value of 29 mg/kg reported in the literature (REFERENCE: Khigiena i Zdraveopazvane. Hygiene and Sanitation 9:50, 1966).

Mouse Study

All mice dosed at 10 mg/kg or greater had immediate convulsions and died on the day of dosing. At a dose of 5 mg/kg, all animals survived. Abnormal clinical signs included tremors, exophthalmos, and convulsions immediately after dosing, but these subsided later in the day. Only weakness was seen later in the day.

In addition, rats administered a single 1 mg/kg oral dose of tetracyanoethylene excreted an average of 16 mg of thiocyanate in their urine in 24 hours compared to historical control values of 0.003-0.05 mg. Therefore, this compound is probably metabolized to cyanide, which could account for its toxicity. In guinea pigs, tetracyanoethylene is a slight skin irritant; the dermal LD50 is 0.1-0.25 g/kg.

This chemical is purchased from an outside vendor and repackaged for sale. Sales volumes are approximately 500 g/year. We will provide the vendor company with a copy of our 8(e) submission letter.

We have reviewed our handling precautions and they are deemed adequate. We are not aware of any adverse health effects among our employees or customers. The enclosed MSDS lists the chemical as a poison by all routes of exposure.

Sincerely,

R. Hays Bell, Ph.D
Vice-President
Corporate Health, Safety, and Environment
(716) 722-5036

RHB:JAF

Enc.

907883
OC

TOXICITY REPORT

Laboratory of Industrial Medicine
Eastman Kodak Company
Kodak Park

July 18, 1962

Chemical: Tetracyanoethylene #7883 (61-416)

Submitted by: Syn. Org.

Acute Toxicity

When administered as a 1% and 10% suspension in 2% aqueous sodium cellulose sulfate, the compound killed mice at oral and intraperitoneal doses of 10 mg/kg. Rats were killed by a 1% suspension in 2% aqueous sodium cellulose sulfate at 5 mg/kg orally and intraperitoneally. Symptoms included weakness, tremors, convulsions, exophthalmus, roughening of the coat. Recovery occurred in all animals that survived the immediate tremors, and convulsions and deaths were delayed for only as long as 30 minutes.

Skin Irritation and Absorption

The solid compound, in quantities varying from 0.1-1.0 g/kg, was moistened slightly with water and held in contact with the depilated skin of guinea pigs under a rubber cuff on a gauze pad for a period of 24 hours. This application showed the compound to be a slight skin irritant, but animals receiving doses as low as 0.25 g/kg died within a period of 24 hours.

Inhalation

Rats exposed for 6 hours to atmospheres containing the compound generated by passing air through a gas washing bottle at room temperature showed no symptoms. There was no detectable loss of weight from the gas washing bottle so it is assumed that because of the low vapor pressure, inhalation exposure actually did not occur.

Remarks

This compound probably is converted to or has a cyanide-like action in the body. The effects are similar to those of NaCN and occur at about the same dosage. The label, "precautions and antidote", should be the same as for NaCN.

David W. Fassett, M.D.

907883

TOXICITY REPORT - E.K.CO. - LABORATORY OF INDUSTRIAL MEDICINE

Chemical: Tetracyanoethylene **No:** 7883 **Source:** Syn Org. **Formula:** $(NC)_2C:C(CN)_2$

Solution	Animals* No. and Species	Route**	Dose Range	Approx. LD_{50}	Symptoms	Time of Death	Wt. Change 2 wks
Acute Toxicity			mg/kg	mg/kg			
1%&10% in 2%NaCS	20 M	PO	5-1600	5-10	Slight to very weak, tremor, convul., exophthalmus, rough coat, recovery in all that survived the immediate tremors and convulsions.	10 mins	2+
"	20 M	IP	1-400	5-10	See above.	5 mins	4+
1% in 2% NaCS	6 R	PO	1-10	5	Gasping, convulsion, vasodilatation, prostration within 30 secs.	5-30min	3+
61-416	6 R	IP	1-10	1-5	Same as PO in rats	30min	2+
					Notebook No.	61 P	416
Skin Absorption and Irritation			g/kg	g/kg			
Solid moist with H_2O	4 G.P.	Cuff	0.1-1.0	0.1-0.25	Moderate edema, spots of #2 erythema and staining. Sl. edema, eschar, some erythema & staining at 1 wk. Scarring and no hair at 2 wks.	1 Day	0
					Notebook No.	61 P	416

FOR CHEMICAL PURPOSES, NOT FOR DRUG USE

EASTMAN KODAK — EASTMAN ORGANIC CHEMICALS — DISTILLATION PRODUCTS Industrial, Rochester 3, N.Y. — A DIVISION OF EASTMAN KODAK COMPANY — MADE IN U.S.A.

POISON! Volatile

Use with adequate ventilation.
Avoid breathing of vapor and contact with the skin or clothing.

*G.P. - Guinea Pig, M - Mouse, R - Rat, RB - Rabbit

**PO - Orally, IP - Intraperitoneally, IM - Intramuscularly, IC - Intracutaneously

5/24/62

Remarks: Highly toxic compound. Rats given 1 mg/kg excreted an average of 16 mg. of thiocyanate in 24 hours. (Previous controls excreted 0.003-0.05mg)

Slight skin irritant, absorbed through the skin.

KF 42862

E 10783 OC

TOXICITY REPORT - E. K. CO. - LABORATORY OF INDUSTRIAL MEDICINE

Chemical: Tetracyanoethylene **No:** 7883 **Source:** Syn Org. **Formula:**

Solution	Animals* No. and Species	Type of Test	Initial Score 24 hrs	Initial Score 48 hrs	Final Score 24 hrs	Final Score 48 hrs	
Skin Sensitization							Notebook No. P

Solution	Animals* No. and Species	Route**	Dose Range mg/kg	Approx. LD_{50} mg/kg	Symptoms	Time of Death	Wt. Change 2 wks
Chronic Toxicity					Notebook No. P		

Type of Exposure	Animals* No. and Species	Conc.	Time	Mortality	Symptoms
Inhalation					
3 1/2L/min. gas washing bottle; room temp. air over cpd.	3 R	No detectable loss of wt.	6 hrs.	0/3	None noted. Av. 2 wk wt. gain(+3)=31g. Notebook No. 61P 416

*G.P. - Guinea Pig, M - Mouse
R - Rat, RB - Rabbit
Remarks:

**PO - Orally, IP - Intraperitoneally,
IM - Intramuscularly, IC - Intracutaneously

MATERIAL SAFETY DATA SHEET

EASTMAN KODAK COMPANY
343 State Street
Rochester, New York 14650

For Emergency Health, Safety, and Environmental Information, call 716-722-5151
For all other purposes, call 800-225-5352, in New York State call 716-458-4014

Date of Revision: 05/01/92 Kodak Accession Number: 907883

SECTION I. IDENTIFICATION

- Product Name: Tetracyanoethylene
- Synonym(s): Ethenetetracarbonitrile
- Formula: C6 N4
- CAT No(s): 119 5858; 119 5866; 119 5874
- Chem. No(s): 07883
- Kodak's Internal Hazard Rating Codes: R: 3 S: 3 F: 1 C: 3-TWZ

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

COMPONENT(S):	Percent	ACGIH TLV(R)	CAS Reg. No.
Tetracyanoethylene	ca. 100	---	670-54-2

SECTION III. PHYSICAL DATA

- Appearance: White to beige crystalline solid
- Melting Point: 198 C (388 F)
- Vapor Pressure: Negligible
- Evaporation Rate (n-butyl acetate = 1): Negligible
- Volatile Fraction by Weight: Negligible
- Specific Gravity (Water = 1): 1.31
- Solubility in Water: Decomposes

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

- Flash Point: Not Applicable
- Extinguishing Media: Water spray; Dry chemical; Carbon dioxide
- Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. USE WATER WITH CAUTION AND IN FLOODING AMOUNTS. Material reacts with water forming cyanide fumes.
- Unusual Fire and Explosion Hazards: Fire or excessive heat may produce hazardous decomposition products. Fire or excessive heat may result in violent rupture of container due to bulk polymerization. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

SECTION V. REACTIVITY DATA

- Stability: Stable
- Incompatibility: Strong oxidizers, water, strong reducing agents, strong acids, strong bases
- Hazardous Decomposition Products: Combustion will produce carbon dioxide and probably carbon monoxide. Oxides of nitrogen may also be present. Heating to decomposition may produce cyanide fumes.
- Hazardous Polymerization: May occur.

SECTION VI. TOXICITY AND HEALTH HAZARD DATA

A. EXPOSURE LIMITS: Not established.

B. EXPOSURE EFFECTS:

Antidote: Always have on hand a cyanide first-aid kit. Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Repeat five times at about 15-second intervals. Call a physician or poison control center immediately.

Inhalation: POISON. May be fatal if inhaled.
Skin: POISON. May be fatal if absorbed through the skin.
Eye: Causes eye irritation.
Ingestion: POISON. May be fatal if swallowed.

C. FIRST AID:
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration with a resuscitator. If breathing is difficult, give oxygen. Call a physician or poison control center immediately.
Skin: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes. Get medical attention immediately.
Eye: Immediately flush eyes with plenty of water for at least 15 minutes and get medical attention.
Ingestion: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

Note to Physicians. If the patient has not responded to amyl nitrite, inject intravenously 10 mL of a 3% solution of sodium nitrite at a rate not greater than 2.5 to 5.0 mL per minute. Follow directly with 50 mL of a 25% solution of sodium thiosulfate at the same rate by the same route. Keep the patient under observation. If the signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in one-half the original doses.

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION:
Use process enclosures, local exhaust ventilation or other engineering controls to reduce dust concentrations to an acceptable level.

B. RESPIRATORY PROTECTION:
If engineering controls are inadequate to control dust concentrations to an acceptable level, a NIOSH approved dust respirator should be worn. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

C. SKIN AND EYE PROTECTION:
Impervious gloves and clothing should be worn. Safety glasses with side shields, goggles or a face shield should be worn.

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SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Keep from contact with oxidizing materials. Keep container tightly closed and away from water, acids, bases, and reducing agents. Since empty container retains product residue, follow label warnings even after container is empty. Do not add water to contents while in a container because of violent reaction and possible flash fire. Store in a cool, dry place.

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SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES

Sweep up material and package for safe feed to an incinerator. Dispose by incineration or contract with licensed chemical waste disposal agency. Discharge, treatment, or disposal may be subject to federal, state or local laws.

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For transportation information regarding this product, please phone the Eastman Kodak Distribution Center nearest you: Rochester, NY (716) 254-1300; Oak Brook, IL (312) 654-5300; Chamblee, GA (404) 455-0123; Dallas, TX (214) 241-1611; Whittier, CA (213) 945-1255; Honolulu, HI (808) 833-1661.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

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